PROGRAMMABLE ATTENUATOR
4430B

KAY ELEMETRICS CORP
FORMERLY
KAY ELECTRIC CO.

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TEAR OFF AT THIS LINE

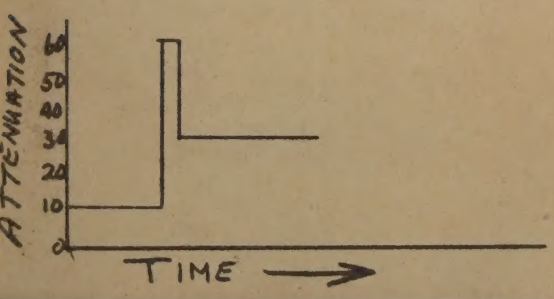
MODEL 4430B PROGRAMMABLE ATTENUATOR

GENERAL INFORMATION

THE 4430B ATTENUATOR IS DESIGNED TO OPERATE EITHER AS A REMOTELY SWITCHED (MANUAL) OR PROGRAMMED (AUTOMATIC) UNIT. THE CONTROLLING DEVICE IS ESSENTIALLY A SWITCH USED TO PLACE A SHORT OR OPEN CIRCUIT ACROSS THE 4430B CONTROL CIRCUITS.

WHEN A SWITCH IS CLOSED, THE RESULTANT SHORT CIRCUIT PLACES A BIAS ON A SCR GATE CAUSING THE SCR TO CONDUCT. THE CURRENT FLOWS THROUGH THE SOLENOID WINDING, MOMENTARILY ENERGIZING IT AND THROWING A STEP OF ATTENUATION IN. TO REMOVE ATTENUATION, THE SWITCH IS OPENED AND AN OPPOSING SOLENOID IS MOMENTARILY ENERGIZED THROWING THE STEP OF ATTENUATION OUT. A SEQUENCING CIRCUIT IS INCLUDED WHICH PERMITS ONLY ONE SWITCH TO BE OPERATED AT A TIME FOR MINIMUM CURRENT DRAIN.

THE CIRCUIT ALSO CONTAINS A SELECTIVE FEATURE TO INSURE THAT THERE IS ALWAYS MORE THAN THE FINAL VALUE OF ATTENUATION IN THE SYSTEM WHEN CHANGING LEVELS. IN OTHER WORDS, ALL STEPS OF ATTENUATION TO BE ADDED ARE SWITCHED IN BEFORE ANY STEPS ARE REMOVED (ATTENUATION IS NEVER LESS THAN THE PROGRAMMED VALUE). THIS IS DONE TO PREVENT THE SIGNAL SOURCE FROM MOMENTARILY OVERLOADING THE DEVICE UNDER TEST.



SPECIFICATIONS

FREQUENCY RANGE: DC to 1.3GHZ

ATTENUATION RANGE: 0 to 135db in 1db steps

ATTENUATION STEPS AVAILABLE: ANY COMBINATION OF NINE STEPS FROM 0.1db TO 30db.

TYPICAL OVERALL ACCURACY: ±1.0db, DC to 0.5GHZ
±1.5db, 0.5 to 1.0GHZ

INPUT AND OUTPUT IMPEDANCE: 50 OHMS

MAXIMUM VSWR: 1.2:1, DC to 0.5GHZ
1.4:1, 0.5 to 1.0GHZ

INSERTION LOSS (db): ≤0.2, DC to 0.25GHZ
≤0.25, 0.25 to 0.5GHZ
≤0.7, 0.5 to 1.0GHZ

SWITCHING SPEED: <20ms for single step
<150ms for maximum attenuation

LINE WEIGHTING: 1248:12333

CONTROL LOGIC REQUIRED: 9 BCD, PLUS COMMON

POWER CAPABILITY: 1W

TRANSITORY ATTENUATION: AT NO TIME DURING SWITCHING IS THE ATTENUATION LESS THAN THE INITIAL OR THE FINAL PROGRAMMED VALUE.

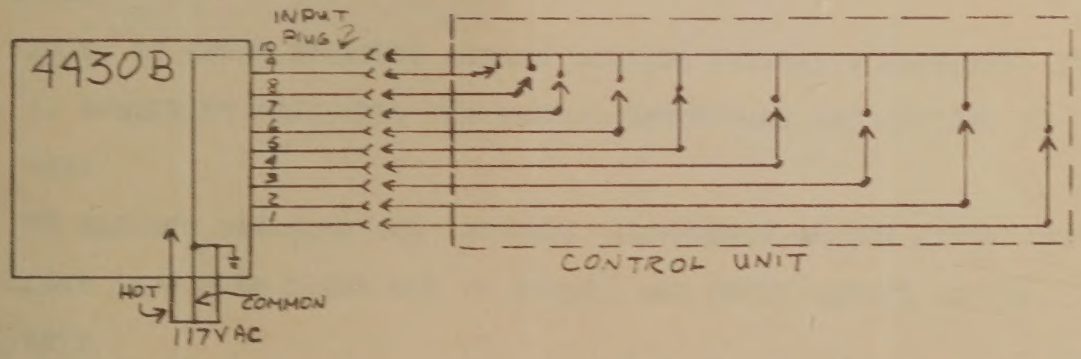
POWER REQUIRED: 117 VOLTS, 60HZ, ONE AMP PEAK/STEP WHILE SWITCHING

OPERATION AND CONNECTION

A. CONTROL CONNECTIONS

1. THE 4430B MAY BE WIRED INTO A PROGRAMMED SYSTEM THROUGH THE USE OF A NINE WIRE CODED INPUT PLUS AC COMMON. EACH STEP OF ATTENUATION REQUIRES AN INDIVIDUAL SWITCH WITH THE AC COMMON AS ONE SIDE. TWO SWITCHES SHOULD NEVER BE WIRED DIRECTLY TOGETHER. THE SYSTEM IS WIRED IN THIS FASHION TO PREVENT THE PRESENCE OF THE LINE VOLTAGE ON THE CHASSIS OF THE EQUIPMENT. IT IS SUGGESTED THAT ONLY THREE WIRE OUTLETS AND PLUGS BE USED.

FIGURE 1, INTERCONNECTING DIAGRAM



2. THE 4430B INPUT PLUG CONNECTIONS ARE IDENTIFIED IN THE FOLLOWING MANNER:

a. THE ATTENUATION LEVELS ARE WIRED TO PINS 1 THROUGH 9 WITH THE LOWEST NUMBERS CORRESPONDING TO THE LOWEST ATTENUATION. FOR EXAMPLE: PIN 1= 1db, PIN 2= 2db, etc.

b. THE AC COMMON IS CONNECTED TO PIN 10.

3. A MANUAL SWITCHING ARRANGEMENT MAY BE CONSTRUCTED FOLLOWING THE SAME OUTLINE AS FOR A PROGRAMMED INPUT. IN THIS PROCEDURE, ANY CONVENIENT LAYOUT MAY BE USED AS LONG AS THE SWITCHES ARE EACH TIED TO AC COMMON.

B. OPERATION

1. INTERCONNECT THE 4430B WITH THE SYSTEM.

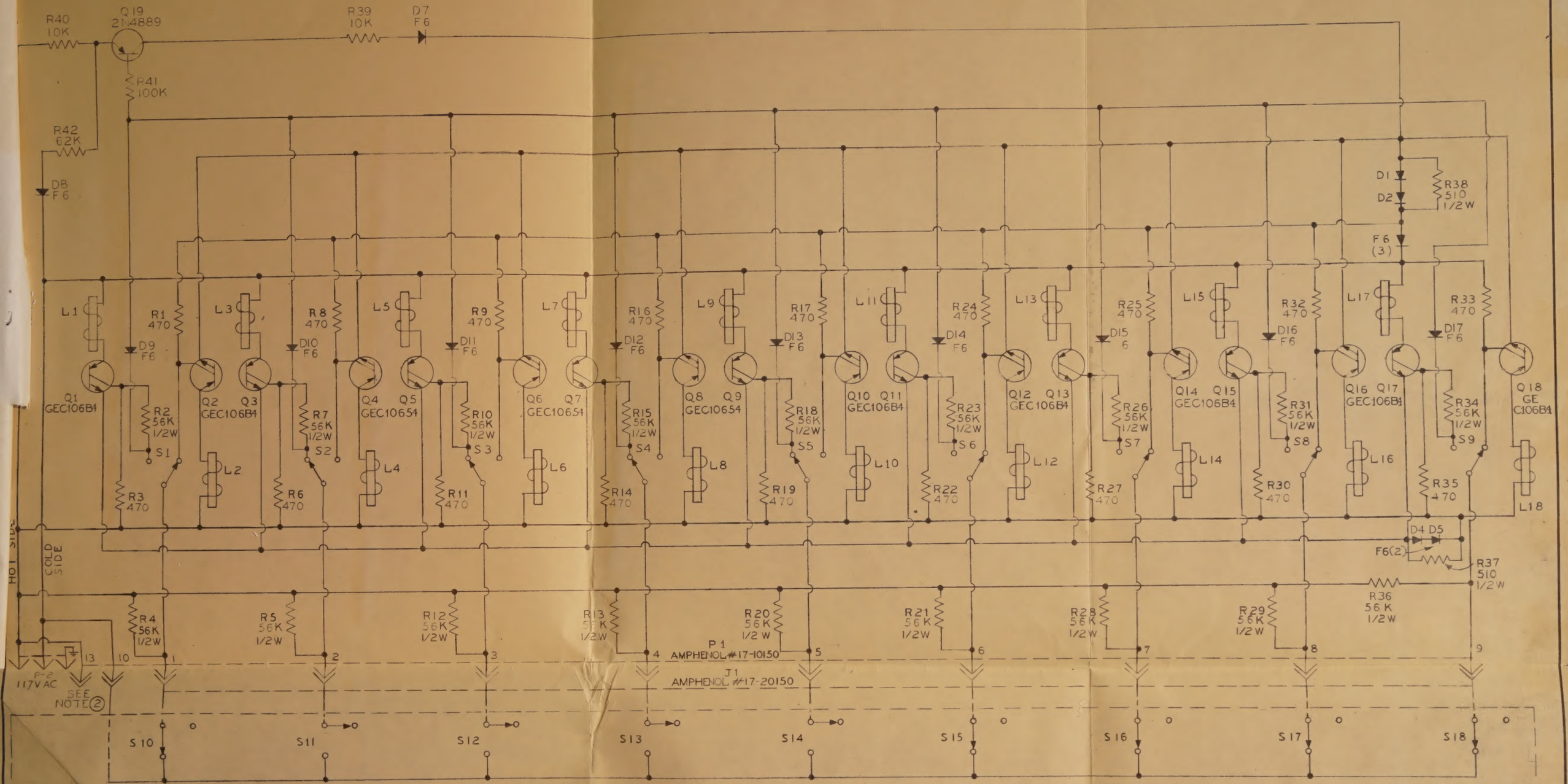
2. PROVIDE A CONNECTION BETWEEN THE4430B AND THE CONTROLLING EQUIPMENT.

3. ESTABLISH THE DESIRED PROGRAM FOR THE SYSTEM.

4. TURN ALL RELATED EQUIPMENT ON AND PLUG THE 4430B INTO A 117 VOLT AC SOURCE.

NOTE: TO AVOID SPURIOUS LOSSES THROUGH IMPEDANCE MISMATCH, IT IS SUGGESTED THAT ONLY THE PROPER CONNECTORS AND CABLING BE USED.

TO PREVENT DAMAGING THE INTERNAL COMPONENTS OF THE ATTENUATOR, CARE SHOULD BE TAKEN NOT TO EXCEED THE POWER RATING OF THE UNIT.



NOTE: UNLESS INDICATED OTHERWISE
~~ALL RESISTANCES ARE IN OHMS 1/4 W~~
ALL SOLENOIDS [L1 - L18] ARE 17V DC

② P13 IS POWER CONNECTION FOR LOGIC CONTROL ADAPTOR 4490A (WHEN USED)

Q18
L18
R36
D17
S18

SCHEMATIC -AC- REMOTE CONTROL MINI ATTENUATOR 4430B

MAT. | FINISH: | SCALE:

TOLERANCES UNLESS OTHERWISE SPECIFIED:
DECIMAL ± .005 | FRACTIONAL ± 1/64 | ANGULAR ± 30 MIN.

CHANGE	DATE	APP
"F" ADDED PIN 13; NOTE ②. ADDED P1 & J1 INFO, NUMBERED PINS	9-30-69	JB
"G" ADDED 1/2W NOTE TO 56K RESISTORS; ADDED GROUND PRINT TO P2	1-2-70	JB

CHANGE	DATE	APP.
"B" DECREASE MAX CURRENT DEMAND PER LINE		
CORRECT ERROR, 11 SCR DWG; RMK (10) IN 459 DIODES, ADDED (6) F6 DIODES @ R37 & R38	2-2-68	JB
"C" ADDED D7 THRU D17; R39 THRU R42; P37 & P38		
WERE 1K; 5 Q1 THRU Q18 WERE SEC 106B1 (S1)	8-12-68	JB
D" R4705 WERE 220 RSAKS WERE 47K; RMKD D6, D23 & D24		
NO JUMPER IN = WITH P38	5-7-69	JB
"E" CORRECTION R1, R8 ETC WERE FORMERLY TIED TO SOLENOID	9-17-69	JB

KAY ELECTRIC CO.
PINE BROOK, N. J.

DWN. BY A. RADEK | DATE 1-10-68
APP. BY JB | DATE 1-10-68

DWG. NO. C10,434 G